



REMARKS

By this amendment, claims 1, 5, 8-9, 54, 58, and 61-62 have been amended. Claims 7, 29-53, and 60 have been canceled. Claims 1-6, 8-22, 54-59, and 61-77 are pending in the application. Applicants reserve the right to pursue the original claims and other claims in this and other applications.

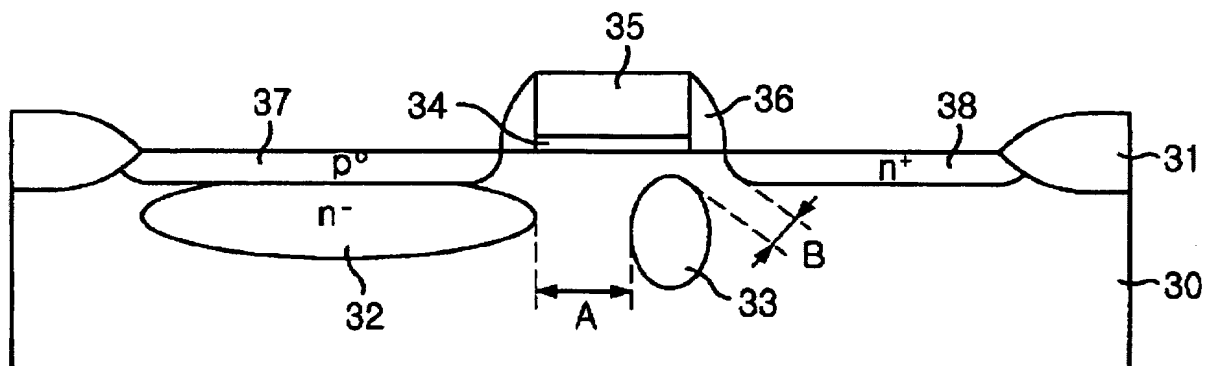
Claims 1-2, 4-5, 7, 9, 11-14, 16, 18-20, and 22-24 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Merrill et al. (US 2005/0087829). This rejection is respectfully traversed.

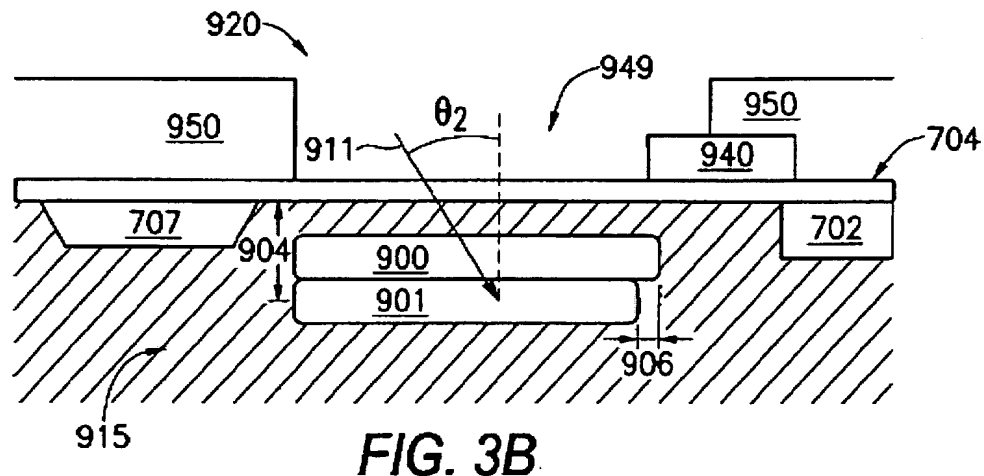
Claim 1, as amended, recites, *inter alia*, an image pixel structure, comprising “a semiconductor substrate of a first conductivity type ...; a gate ...; and a photodiode within said substrate, said photodiode including an implant region of a second conductivity type, a first portion of which extends further towards a region of said substrate beneath said gate than a second portion of said implant region, wherein said second portion is adjacent to ... said first portion.” (Emphasis added.) Merrill et al. does not teach or suggest this limitation. Merrill et al. discloses “layer 51 (made of n-type semiconductor) and layers of p-type semiconductor material 50 above and below layer 51, ... layer 46 (made of n-type semiconductor) and layers of p-type semiconductor material 45 above and below layer 46, ... and layer 41 (made of n-type semiconductor) and p-type semiconductor substrate material 40 above and below layer 41.” Paragraph 0092. There is no second portion adjacent to a first portion of a second conductivity type. Since Merrill et al. does not disclose all the limitations of claim 1, claim 1 and dependent claims 2, 4-5, 7, 9, 11-14, 16, 18-20, and 22-24 are not anticipated by Merrill et al. Applicants respectfully request that the 35 U.S.C. § 102(e) rejection of claims 1-2, 4-5, 7, 9, 11-14, 16, 18-20, and 22-24 be withdrawn.

Claims 1, 4, 5, 7, and 23-24 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Shim (US 2002/0175355). This rejection is respectfully traversed.

Claim 1, as amended, recites, *inter alia*, an image pixel structure, comprising “a semiconductor substrate of a first conductivity type having a surface; a gate over a surface of the substrate; and a photodiode within said substrate, said photodiode including an implant region of a second conductivity type, a first portion of which extends further towards a region of said substrate beneath said gate than a second portion of said implant region.” (Emphasis added.) Shim does not teach or suggest this limitation. Shim discloses in an n-type implant region 32 in a p-type substrate 30 and a p-type implant region 37. Shim Fig. 3D (reproduced below). There is no first and second portion of an implant region of a second conductivity type. See Specification FIG. 3B (reproduced below). Since Shim does not disclose all the limitations of claim 1, claim 1 and dependent claims 4, 5, 7, and 23-24 are not anticipated by Shim. Applicants respectfully request that the 35 U.S.C. § 102(e) rejection of claims 1, 4, 5, 7, and 23-24 be withdrawn.

Shim Fig. 3D



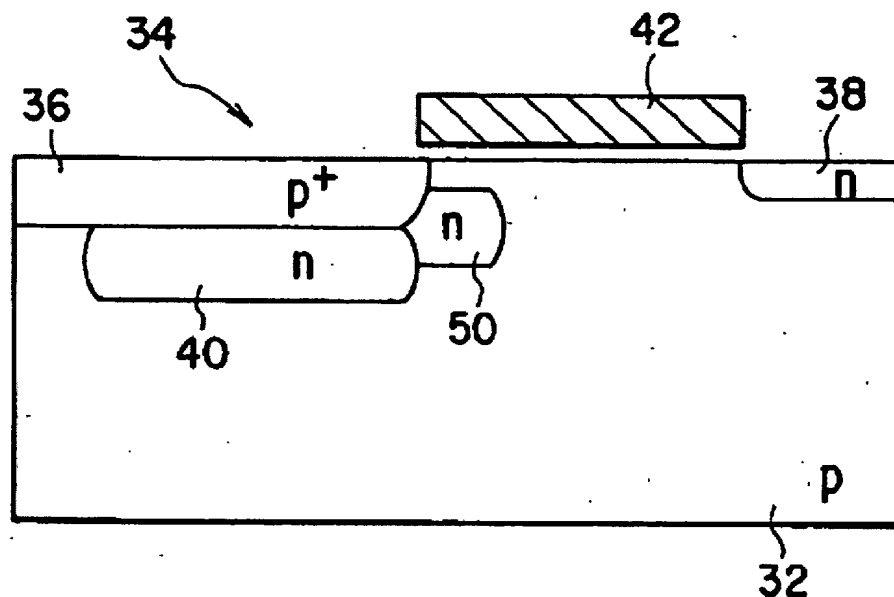
Specification FIG. 3B

Claims 1-2, 4-5, 7, 9, 11, 15, and 22-26 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Nakamura et al. (US 2004/0108502). This rejection is respectfully traversed.

Claim 1, as amended, recites, *inter alia*, an image pixel structure, comprising “a semiconductor substrate of a first conductivity type ...; a gate ...; and a photodiode within said substrate, said photodiode including an implant region of a second conductivity type, a first portion of which extends further towards a region of said substrate beneath said gate than a second portion of said implant region, wherein said second portion is ... substantially underneath said first portion.” (Emphasis added.) Nakamura et al. does not teach or suggest this limitation. Nakamura et al. discloses in Fig. 9 signal accumulating regions 40, 50 which are adjacent to one another. There is no first portion above a second portion. Nakamura et al. Fig. 9 (reproduced below). Since Nakamura et al. does not disclose all the limitations of claim 1, claim 1 and dependent claims 2, 4-5, 7, 9, 11, 15, and 22-26 are not anticipated by Nakamura et al. Applicants

respectfully request that the 35 U.S.C. § 102(e) rejection of claims 1-2, 4-5, 7, 9, 11, 15, and 22-26 be withdrawn.

Nakamura et al. Fig. 9



Claims 3 and 27-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. This rejection is respectfully traversed. Claims 3 and 27-28 depend from claim 1 and are patentable at least for the reasons mentioned above. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 3 and 27-28 be withdrawn.

Claims 9, 11, 13, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shim in view of Lee et al. (US 2003/0030083). This rejection is respectfully traversed. Claims 9, 11, 13, and 15 depend from claim 1 and are patentable at least for the reasons mentioned above. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 9, 11, 13, and 15 be withdrawn.

Claims 54-58, 60, 62, 64, 66, 68, and 74-77 stand rejected under 35 U.S.C. § 102(e) as being unpatentable over Nakamura et al. in view of Nagata et al. (US 6,407,417). In light of the text of the rejection, Applicant presumes this is meant to be a 35 U.S.C. § 103(a) rejection and will be treated as such. This rejection is respectfully traversed. In order to establish a *prima facie* case of obviousness “the prior art reference (or references when combined) must teach or suggest all the claim limitations.” M.P.E.P. §2142. Neither Nakamura et al. nor Nagata et al., even when considered in combination, teach or suggest all limitations of independent claim 54.

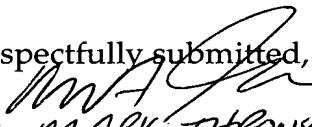
Claim 54, as amended, recites, *inter alia*, pixel imager system, comprising “a semiconductor substrate of a first conductivity type ...; a gate ...; and a photodiode within said substrate, said photodiode including an implant region of a second conductivity type, a first portion of which extends further towards a region of said substrate beneath said gate than a second portion of said implant region, wherein said second portion is substantially underneath said first portion.” (Emphasis added.) As discussed above regarding the patentability of claim 1, Nakamura et al. does not teach or suggest this limitation. Nakamura et al. teaches signal accumulating regions 40, 50 which are adjacent to one another. There is no first portion above a second portion. Nor is Nagata et al. cited for this limitation. Thus, Nagata et al. does not remedy the deficiency of Nakamura et al. Since Nakamura et al. and Nagata et al. do not teach or suggest all of the limitations of claim 54, claim 54 and dependent claims 55-58, 60, 62, 64, 66, 68, and 74-77 are not obvious over the cited references. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claims 54-58, 60, 62, 64, 66, 68, and 74-77 be withdrawn.

Claims 6, 8, 10, 17, 21, 59, 63, 65, 67, and 69-74 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any

intervening claims. Claims 6, 8, 10, 17, 21, 59, 63, 65, 67, and 69-74 depend, respectively, directly, or indirectly from independent claims 1 and 54, and are allowable for at least the reasons set forth above.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Dated: September 14, 2005

Respectfully submitted,

By MARK THRONSON #33,082
Thomas J. D'Amico
Registration No.: 28,371
Rachael Lea Leventhal
Registration No.: 54,266
DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526
(202) 785-9700
Attorneys for Applicants